

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent
appln. of : Keith C. Hong, et al.

Appln. No: 10/600,809

Filed: June 20, 2003

For: **ALGAE RESISTANT ROOFING GRANULES WITH
CONTROLLED ALGAEICIDE LEACHING RATES
ALGAE RESISTANT SHINGLES, AND
PROCESS FOR PRODUCING SAME**

Group Art
Unit: 1762

Examiner: Elena Tsoy

Conf. No.: 9261

Docket No: 183-01

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY BRIEF

Sir:

This brief is being submitted electronically on April 15, 2008 in reply to the Examiner's Answer dated February 15, 2008 in the above-referenced matter.

The Examiner's rejections are based on legal error. In particular, the Examiner has misapplied the standard of Graham v. John Deere, 383 U.S. 1 (1966), in her Section 103 analysis. Instead of taking a common sense approach to determining the scope and content of the prior art, the first Graham factor, the Examiner justifies her hindsight reconstruction of applicants' claimed invention by identifying a "field" to which each of the cited reference purportedly "relate."

- I. Rejection of Claims 4-5, 7-8, 13, 14, 39 and 40-45 under 35 U.S.C. 103(a) over Joedicke/Skadulis/McMahon in view of Ine et al and further in view of Balcar et al.

With respect to this first rejection under Section 103, the Examiner states that "[a]ll of Joedicke, Skadulis, and McMahon and Ine et al. and Balcar et al. are in a crushed stone/mineral field and/or mineral dust by-product generated in different industrial fields." (Examiner's Answer, page 10, second paragraph, emphasis omitted). For example, the Examiner argues that each of the primary references teach that base particles are obtained by crushing and screening mineral aggregates; the "Ine et al. is in a crushed stone field"; and that "Balcar et al. is in a crushed mineral field." The Examiner thus implicitly admits that these three groups of cited references are in *different* fields of endeavor. Only the primary references are in the same field of endeavor as applicants' invention.

The Examiner also argues that Ine et al. is analogous art since Ine et al. teach a solution of "essentially the same problem" addressed by applicants, recycling a stone fine powder after crushing and screening to produce granules of a desired size.

The Examiner also argues that Ine et al. and Balcar et al. teach a solution of the "same problem" addressed by applicants, namely, the problem of recycling/aggregating mineral dust, and thus are reasonably pertinent.

The Examiner puts the rabbit into the hat by her erroneous identification of the problem solved by the present inventors. The inventors sought to make algae-resistant roofing granules with stone dust, not simply find some way to recycle the stone dust. Nothing in the specification supports the Examiner argument that the applicants sought to solve the less focused, broader problem she has identified. The Examiner attempts at drawing a link to Balcar et al., in particular, are unreasonable stretches. For example, the Examiner implies that the applicants' disclosure of the use of quartz relates to Balcar et al.'s use of glass. But of course, quartz is crystalline silicon dioxide, and glass is a

non-crystalline silicon oxide. Also, the Examiner suggests that the by-product described in applicants' specification "might be" hazardous." This is pure speculation on the part of the Examiner – nothing in the specification supports it – and is also contrary to common sense. Who would buy shingles made from hazardous waste?

In support of her misidentification of applicants' field of endeavor, the Examiner quotes from the Detailed Description section of the specification which describes the types of minerals that can be employed in the process of the invention and simply ignores the Field of the Invention section, where applicants state the actual field of endeavor.

In the end, the Examiner simply applies a legally erroneous test. The Examiner concludes that "Applicants' invention relates also to any field that generates mineral dust, and recycles the dust." (Examiner's Answer, page 12, first full paragraph). However, the test is not whether applicants' claimed invention "relates to" the cited prior art. The test is whether the cited prior art is either in the same field of endeavor, which the secondary references are not, as admitted by the Examiner, or whether they are "reasonably pertinent" to the problem addressed by the applicants. In *re* *ICON Health & Fitness*, 496 F.3d 1374 (Fed. Cir. 2007). The Examiner's broad test draws in prior art which is neither in the same field of endeavor nor reasonably pertinent to the claimed invention.

The Examiner does not seriously challenge applicants' arguments that neither *Ine et al.* nor *Balcar et al.* are not reasonably pertinent to the problem solved by the present invention. Instead, the Examiner argues that one cannot show nonobviousness by attacking references individually where the references are based on a combination of references, citing *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 198), and *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). However, the Examiner has erroneously combined analogous art (the primary references) with non-analogous

art, thus failing to properly assess "the scope and content of the prior art." Applicants are not attacking the secondary references, just the combination made by the Examiner.

The Examiner also construes the claims of the invention by stating that the words "roofing granules" that appear in the preamble should not be accorded any weight because they merely recite an intended purpose. However, this construction, even if it were correct, does not broaden the analogous art. Balcar et al. still teach how to insolubilize toxic materials while applicants teach how to make porous granules that gradually release algacide. Ine et al. teaches how to temporarily aggregate dust for making road base, while applicants need to insolubilize the binder to make granules that last at least as long as a roof.

The Examiner further argues that the "Problem of recycling mineral dust by-product is not [a] problem existing only in a process for making roofing granules [but is] a common problem for all areas of industry that generate dust." (Examiner's Answer, page 14, second paragraph). However, applicants' claims are not limited to "recycled" stone dust. Here, the Examiner is improperly adding her own limitation to the claims in order to try to expand the scope of the analogous prior art.

With respect to Balcar et al., the Examiner notes that Balcar et al. discloses the use of sodium silicate for pelletizing dust. However, Balcar et al. suggests pelletizing or pre-agglomerating the dust only for the purpose of cutting "the potential for air entrainment of the dust and [to] eliminate an inhalation hazard and nuisance" when Balcar et al.'s process was being used on an industrial scale (col. 8, lines 22-39). There is no question that this is merely an additional preparative step before the agglomerates are fused at 1200 degrees C to form a mass that must be "broken out of the crucible" (Example 2, lines 39-41). One of ordinary skill in the art would understand that 1200 degrees C would fuse the glass particles, and the sodium silicate would dissolve in the silica glass formed. Sodium silicate does not serve as a binder in Balcar et al.'s product.

Further, Balcar et al. does not disclose that the aqueous sodium silicate binder should be cured before mixing the agglomerated dust and fusing the mixture. Thus, the water in the aqueous sodium silicate acts as an adhesive for pelletizing the dust and is responsible for the agglomeration, rather than the sodium silicate, which is contrary to the Examiner's characterization of Balcar et al. The Examiner improperly focuses on only a portion of Balcar et al.'s process, instead of considering the reference as a whole. An accurate consideration of Balcar et al. shows that the Examiner has not established a *prima facie* case of obviousness, because Balcar et al. does not disclose insolubilizing the binder as required by independent claim 39.

Further, with respect to Balcar et al., Balcar et al. is aimed at containment of hazardous waste, which is contrary to the idea of having copper of another material leach out in a controlled manner. If the hazardous material leaches out, it is clearly not encapsulated and has not been rendered nontoxic. Balcar et al. is not merely nonanalogous art; if Balcar et al. is to be considered at all Balcar et al. evidences the nonobviousness of applicants' presently claimed invention since it teaches containment rather than controlled release.

With respect to applicants' argument that the Examiner improperly relied upon an unreliable machine translation of the Japanese reference (Ine et al.), the Examiner states the her "rejection is based mainly on Abstract which is considered to be a reliable reference, and P1 and P2 which are comprehensible to because they describe the state of the art known to the Applicants." (Examiner's Answer, page 15, last paragraph, emphasis added). However, in her actual final rejection, the Examiner cited to page 8 of the machine translation. (Examiner's Action of July 24, 2007, page 4, first full paragraph, page 5, first full paragraph). Thus, the Examiner has grudgingly admitted she did rely on an unreliable translation. Similarly, pages 1 and 2 may be comprehensible to the Examiner, but they are on their face unreliable because they are the result of machine

translation. All the rejections entered should be reversed because they all share this improper and legally erroneous basis.

The obviousness rejection based on Joedicke/Skadulis/McMahon in view of Ine et al and further in view of Balcar et al. is erroneous because the Examiner has improperly relied upon nonanalogous art and because the Examiner has failed to make out a *prima facie* case of obviousness. The Board should reverse.

II. Rejection of Claims 9-12 under 35 U.S.C. 103(a) over Joedicke/Skadulis/McMahon in view of Ine et al and further in view of Balcar et al. and further in view of Ryan

In response to applicants' argument that Ryan is not analogous art, the Examiner argues that the words "roofing granules" in the preamble of applicants' claims are not a limitation but merely a statement of intended use, and so that the "claim language would read on any porous inorganic particles coated with cuprous oxide or zinc oxide." (Examiner's Answer, page 16, second paragraph). However, the Examiner is herself ignoring the words of applicants' claims in making this assertion. Claim 39, from which claims 9-12 ultimately depend, requires "a mixture including stone dust and a binder." The Examiner ignores the requirement that stone dust be used when she construes the claims to read on "any porous inorganic particles." "Inorganic particles" subsumes glass dust, iron filings and ice cubes, none of which can be accurately identified as "stone dust." In addition, the Examiner erroneously reads a second limitation into applicants' claims. There is no reference to "coating" in applicants' claims either.

The Examiner's erroneous approach here is to ignore what the applicants have to say about the purpose of their invention, focus on one step of the process claimed, state without any evidence that this was the "particular problem with which applicant was concerned," and then find otherwise wholly irrelevant art, such as Ryan, which suggests

this process step. This is legally erroneous reconstruction of applicants' claimed invention informed by applicants' own disclosure.

Ryan actually has a completely different and inconsistent objective and is not analogous art. Ryan employs copper on a support as a catalyst. To the extent that the copper gradually leaches out, the catalyst function is destroyed. Conversely, one of ordinary skill in the art following Ryan would not expect copper to leach out, again evidence of the nonobviousness of the present invention.

The Examiner also argues that Joedicke, Skadulis and McMahon would motivate one of ordinary skill in the art to seek methods of recycling the dust produced by stone crushing in order to prevent environmental pollution. (Examiner's Answer, page 18, first full paragraph). However, each of the primary references relate to roofing granules, not to the production of crushed mineral aggregate. In fact, there is no mention of stone dust in any of the references. Thus, Examiner's suggested motivation simply does not exist. The Examiner also argues that Ine et al. would motivate one of ordinary skill in the art to recycle stone dust. However, Ine et al. granulate stone dust for use as a roadbed stabilizer using lime as binder so that the material is suitable for stabilizing soil.

As noted above, the Examiner improperly extracts and isolates a portion of Balcar et al.'s disclosure, namely the use of aqueous sodium silicate to granule dust, and ignores the rest of Balcar's process, namely fusing the mixture of glass dust, hazardous waste dust and sodium silicate at a high temperature to form a solid mass which must be fractured. Balcar et al. does not disclose insolubilizing the sodium silicate binder, but rather dissolving the sodium silicate in silicate glass at extremely high temperatures to form a solid mass when cooled. Thus, the Examiner has not made out a *prima facie* case of obviousness, and this rejection is based on legal error.

One of ordinary skill in the art would not have any expectation of success in preparing algaecidal roofing granules following Ryan and/or Balcar et al., which both require the metal to be insolubilized so that could not function as an algaecide.

The rejection of claims 9-12 under 35 U.S.C. 103(a) over Joedicke/Skadulis /McMahon in view of Ine et al and further in view of Balcar et al. and further in view of Ryan is also erroneous because the Examiner has once again improperly relied upon nonanalogous art and because the Examiner has failed to make out a *prima facie* case of obviousness. The Examiner has relied on an inherently unreliable document, Ine et al., in making this rejection. The Board should also reverse this rejection.

III. Rejection of Claims 46-50 under 35 U.S.C. 103(a) over Joedicke/Skadulis/McMahon in view of Ine et al and further in view of Balcar et al. and further in view of lwata et al.

The Examiner relies upon lwata et al. "to show that the distribution and porosity of granulated powder material may be controlled by particle size distribution of the granules, shape of the granules and/or amount of the binder." (Examiner's Answer, page 21, first full paragraph, citations omitted). This statement does not make sense. The "distribution" of the granules must be "controlled by" the "particle size distribution." In making her reconstruction of applicants' claims here rejected, the Examiner seems to have extracted a few snippets from lwata et al., without actually reading the reference. lwata et al. is concerned about making a friction material for a brake. The porosity of the *friction material* depends on the particle size distribution and shape of the granules (col. 3, lines 3-8). The only reference in lwata et al to the porosity of the granules themselves is in the last paragraph of the specification (col. 6, lines 3-9), which teaches that the wear amount of the brake pad or friction article increase when the porosity of the granules themselves is greater than 4 percent, so that the porosity should be maintained at below 4 percent. The granules themselves are made up of binder resin and power

(fiber) material (cf. Fig. 2), but Iwata et al. is silent on how to achieve low granule porosity.

Iwata et al. is wholly nonanalogous art. Once again, the Examiner tries to make Iwata et al. analogous art by redefining, by hindsight-guided reconstruction, the problem that the applicants were concerned with. In this case, the Examiner states that the applicants were concerned with controlling the porosity of the granules, or by selection of the particle size distribution, or by adjusting the ratio of stone dust to aluminosilicate. (Examiner's Answer, page 24, first full paragraph). The Examiner is again erroneously breaking down applicants' claimed invention into a series of steps or aspects, and then equating the claimed invention with a subpart to expand "the problem" that applicants are concerned with. However, in the case of this rejection the Examiner has not even put a proper rabbit into the hat.

Iwata et al. adds nothing to remedy the deficiencies of the combination of the primary references, Ine et al. and Balcar et al., and so the combination including Iwata et al. fails to establish a *prima facie* case of obviousness. In particular, Iwata et al. does not disclose use of a binder for stone dust to form porous inert base particles, or providing an inorganic algaeicide on or within the base particles, or insolubilizing the binder to produce granules. Iwata et al. teach granule porosity to be avoided, or at least kept below four percent for their friction material application.

The rejection of claims 9-12 under 35 U.S.C. 103(a) over Joedicke/Skadulis /McMahon in view of Ine et al. and further in view of Balcar et al. and further in view of Iwata et al. should be reversed. The Examiner has once again improperly relied upon nonanalogous art. In addition, the Examiner has failed to make out a *prima facie* case of obviousness, and relied upon an unreliable reference, Ine et al. The Board should reverse this rejection.

Respectfully submitted,

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